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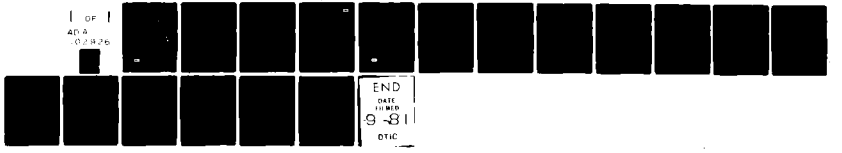

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LEVEL II

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THE VALUE OF STABLE EMPLOYMENT AS INFERRED FROM MARKET WAGES

Robert P. Trost

The Public Research Institute
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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This paper estimates the value employees place on stable employment. Here the term "stable employment" means a relatively low probability of temporary and/or permanent layoffs. This value is estimated by regressing individual wage rates on exogenous variables and proxy variables for unstable employment. The sign and size of the coefficients on these proxy variables in the wage equation measures the value of stable employment in terms of the hourly wage rate.

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20 The wage equation is estimated using the Michigan and Parnes survey data. The results indicate that the wage elasticity with respect to instability is .3. This means that if one industry is 50 percent more stable than another, then other things equal, the more stable industry would have a 15 percent lower wage rate.

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THE VALUE OF STABLE EMPLOYMENT AS INFERRED FROM MARKET WAGES

Robert P. Trost

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INTRODUCTION

In order to attract and hold workers of desired quality, the federal government must set its pay scale to be comparable with the pay scale in the private sector. Here the term "comparable" pay only means identical pay when the quality of working life (e.g., work conditions, hours, vacation) and the job stability of the federal and private jobs being compared are exactly alike. In general, wages can be higher or lower than in the private sector depending on the relative value workers place on characteristics of the job other than pay. For example, Lucas (1977) shows that workers do receive substantially higher money wages in compensation for undertaking jobs embracing repetitive routines and obnoxious physical work environments. While Classen (reference 2) has examined the effect of stable employment on wages, as far as I know, no one has taken the approach proposed below. This paper should fill that gap in the literature.

METHODOLOGY

I will estimate the value workers place on stability in employment with a simple extension of the equation estimated by Lucas (1977). What Lucas does is estimate an equation where log of wages is regressed on age, a dummy variable for union status, and several probabilities of whether or not the worker holds a job with certain job attributes such as nonsedentary or repetitive tasks. I will estimate a similar equation except that instead of using the probabilities that a worker holds a job with various job attributes, a dummy variable to capture the effect of work conditions on wages will be used. In addition, one of the job characteristics included in the regression equation will be measures of "instability" in the industry in which the individual works. Here the term "instability" refers to an irregular pattern of hours worked over time (i.e., frequent temporary layoffs) and in some years a high probability of being permanently laid off. So "unstable" industries will thus have average annual employee earnings and levels of total employment that fluctuate over time. This variable was not included in the analysis presented in Lucas (1977). The coefficient of this variable is an estimate of the pay differential firms must offer to compensate for job instability and, hence, is a measure of the value workers place on stability. The simple approach proposed here then amounts to regressing the log of wages on a set of exogenous variables Z (such as age, education and working conditions) and a variable ISTAB that measures instability. This equation is given by (1):

$$\log(\text{wages}) = B'Z + \gamma ISTAB + \varepsilon \qquad (1)$$

where ε is a disturbance term.

MEASURES OF INSTABILITY

Ideally, we would like one direct measure of instability for each major industrial code. One could then use micro data to estimate equation (1). Since no such measure exists, some proxy variables have to be found.

One choice as a proxy variable is some measure of variability in annual earnings (for the typical worker in the industry). Two other choices are variations in total annual employment and average weekly hours in the industry. The argument for using these measures is that unstable industries will have larger year-to-year fluctuations in annual earnings, total employment, and weekly hours than relatively stable industries.

To get a measure of the variability in annual earnings, employment, and weekly hours, one can use several years of annual Bureau of Labor Statistics data to calculate the coefficients of variation of each variable in all industries. As a second measure of these variations, one can calculate the percentage changes of earnings, employment, and weekly hours and use the standard deviation of these percentage changes as a measure of variability. The second measure is more in the spirit of what is meant by variability--a cyclical or up-and-down pattern of earnings, employment, and weekly hours. In the first measure, a growing industry may have a high coefficient of variation in annual earnings, employment, and hours. This is because employment, hours, and earnings, perhaps, will be increasing over time in growth industries. However, an industry with a constant growth rate in employment and average annual earnings should not be labeled an "unstable" industry. If anything, it is a stable industry. By using the standard deviation of percentage changes instead of the coefficient of variation, we will avoid the problem of labeling growth industries as "unstable."

REGRESSION RESULTS

Three separate data sets are used to estimate equation (1). These data sets are: (1) the 1971 wave of the University of Michigan survey data, as described in A Panel Study of Income Dynamics (1972), (2) the 1971 wave of the Parnes NLS data for young men, and (3) the 1971 wave of the Parnes NLS data for old men. Table 1 gives the means of the variables for each data set. Table 2 to 4 contain the regression results. The dependent variable is the natural logarithm of the 1971 hourly wage rate. The three measures of instability were calculated using Bureau of Labor and Statistics (Employment and Earnings Handbook, 1975) annual data for production workers in various industries. These three measures were calculated using annual data from 1965 to 1970. The variable CVAREARN is the coefficient of variation of annual earnings. The other two measures of instability, SDPCEMP and SDPCHRS, are, respectively, the standard deviations of the percentage changes in employment levels and average weekly hours.

The a priori expectations concerning the coefficients of these stability proxy variables is that they be positive. A positive coefficient would mean that individuals working in industries with large fluctuations in earnings, hours, and employment need to be compensated with a higher hourly wage rate than similar individuals in more stable industries. Also included in the regressions are of the following demographic variables: a race dummy (DRACE = 1 if white), a sex dummy (DSEX = 1 if male), a skill dummy (DSKILL = 1 if individual has a skilled or professional job), three regional dummies (DNE, DNC, DWEST = 1 if individual works in the NE, NC, or Western region of the U.S.), an education dummy (DHSG = 1 if high school graduate), a marital status dummy (DMARR = 1 if married), poor working condition dummy (DWKCOND = 1 if the individual has poor working conditions), two city-size dummies (DCITY1 = 1 if live in SMSA, in central city and DCITY2 = 1 if live in SMSA, not in central city; the omitted group is individuals who do not live in a SMSA) and continuous variables (EDUC, IQ) for the level of education and IQ. What these results tell us is that CVAREARN and SDPCEMP are good proxy variables for instability in given industries, but that SDPCHRS is not a good proxy. The insignificant coefficient on SDPCHRS may reflect the effect of the 40 hour work week institution on firm behavior. Because of the institution, firms may tend to vary employment and wages rather than hours. Hence, during downswings firms will tend to decrease employment and wages but not lower the average hours worked in a week of those individuals who remain.

TABLE 1

VARIABLE MEANS

Variable	Means of Variable: Michigan	Parnes (young men)	Parnes (old men)
CVAREARN	2.289	2.152	2.197
SDEMP	174.57	98.611	87.435
SDHRS	.6077	.627	.596
SDPCEARN	1.9493	1.893	2.025
SDPCEMP	3.287	3.271	3.362
SDPCHRS	1.1912	1.196	1.221
LNWAGE	1.1737	1.516	1.459
DRACE	.5953	.856	.725
DMARR	.7971	.716	.884
DCITY1	--	.333	.344
DCITY2	--	.339	.321
IQ	--	100.106	--
EDUC	--	13.05	9.212
DSKILL	.4746	--	--
DSEX	.8489	--	--
DNE	.1793	--	--
DNC	.2864	--	--
DWEST	.0992	--	--
DHSG	.4239	--	--
DWKCOND	.15	--	--

VARIABLE DEFINITIONS

CVAREARN = Coefficient of Variation of Annual Earnings
SDEMP = Standard Deviation of Employment
SDHRS = Standard Deviation of Weekly Hours
SDPCEARN = Standard Deviation of the Percentage Change in Earnings
SDPCEMP = Standard Deviation of the Percentage Change in Employment
SDPCHRS = Standard Deviation of the Percentage Change in Weekly Hours
LNWAGE = Natural Logarithm of the 1971 Hourly Wage Rate
DRACE = 1 if white
DMARR = 1 if married
DCITY1 = 1 if individual lives in a SMSA, central city
DCITY2 = 1 if individual lives in a SMSA, not central city
IQ = Standard IQ Score
EDUC = Highest Grade Completed
DSKILL = 1 if individual has a skilled or professional job
DSEX = 1 if male
DNE = 1 if individual works in northeastern region of U.S.
DNC = 1 if individual works in north-central region of U.S.
DWEST = 1 if individual works in western region of U.S.
DHSG = 1 if individual is a high school graduate
DWKCOND = 1 if individual has poor working conditions

TABLE 2

REGRESSION RESULTS SHOWING THE EFFECT OF STABLE EMPLOYMENT ON WAGES USING THE MICHIGAN SRC DATA

(Dependent Variable = Ln (Hourly Wage Rate))

Variable	Coefficient	t-statistic
Intercept	.3718	--
SDPCHRS	-.0275	.78
DRACE	.052	2.45
DSKILL	.148	7.00
DSEX	.332	6.65
DMARR	-.0037	.08
DNE	.187	6.60
DNC	.216	8.54
DWEST	.248	7.09
DHSG	.111	5.34
SDPCEMP	.0364	4.81
COVAREARN	.0717	10.23
DWKCOND	.0183	.68

RSQR = .5109
STDERR = .28295
No.Observations = 887

TABLE 3

REGRESSION RESULTS SHOWING THE EFFECT OF STABLE EMPLOYMENT ON WAGES USING THE PARNES YOUNG MEN DATA

(Dependent Variable = Ln (Hourly Wage Rate)

Variable	Coefficient	t-statistic
Intercept	.262	6.23
CVAREARN	.040	6.23
DRACE	.157	4.603
DMARR	.214	9.09
DCITY1	.122	4.54
DCITY2	.151	5.81
EDUC	.041	6.26
IQ	.002	2.70
SDRCEMP	.011	1.98
SDPCHRS	-.019	.66

RSQR = .210
STDERR = .363
No.Observations = 1193

TABLE 4

REGRESSION RESULTS SHOWING THE EFFECT OF STABLE EMPLOYMENT ON WAGES USING THE PARNES OLD MEN DATA

(Dependent Variable = Ln (Hourly Wage Rate)

Variable	Coefficient	t-statistic
Intercept	.421	--
CVAREARN	.033	3.79
DRACE	.270	7.58
DMARR	.156	3.61
DCITY1	.229	6.73
DCITY2	.266	7.67
EDUC	.052	11.54
SDPCEMP	.015	1.78
SDPCHRS	-.048	1.23

RSQR = .269
STDERR = .502
No.Observations = 1375

SUMMARY

In this paper I discuss a simple way of estimating the value of stable employment as inferred from market wages. The essence of my approach is to find proxy variables for the unobservable variable "unstable" employment.

The model is estimated using the Michigan and Parnes survey data. The coefficient of variation of annual earnings and the standard deviation of percentage changes in employment levels were found to be good proxies for unstable employment.

What these results tell us is that in industries where annual earnings and employment levels fluctuate greatly, workers tend to get paid a high hourly wage rate. For example, consider the results presented in table 2. We want to answer the following question: How responsive are wages to a 10 percent increase in instability as measured by the combined effect of SDPCEMP and CVAREARN? When evaluated at the means of all exogenous variables, predicted wages are $3.23/ hour. If we increase SDPCEMP and CVAREARN by 10 percent, predicted wages are $3.33/ hours. Hence, wages rise by 3 percent, and the elasticity of wages with respect to instability is .3. This indicates that in industries where annual incomes are more stable (such as in government service jobs), an hourly wage rate which is determined by market forces will be lower than similar jobs in unstable industries. This is an important result that should be considered when setting Government Service (GS) rating pay scales. For example, if government service jobs are 50 percent more stable than similar private sector jobs, comparable pay in the GS jobs means that ceteris paribus GS jobs should pay 15 percent less than similar jobs in the private sector.

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